UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/762,656 | 01/22/2004 | John S. Wheat | 8540P-000185 | 5141 |

27572 7590 12/17/2007

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

| EXAMINER | |
|---|---|
| CHUO, TONY SHENG HSIANG | |
| **ART UNIT** | **PAPER NUMBER** |
| 1795 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 12/17/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/762,656 | WHEAT ET AL. | |
| | Examiner | Art Unit | |
| | Tony Chuo | 1795 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-4,6-31 and 33-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-31 and 33-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/12/07 has been entered.

### *Response to Amendment*

2. Claims 1-4, 6-31, and 33-39 are currently pending. The amended claims do not overcome the previously stated 102 and 103 rejections. Therefore, upon further consideration, claims 1-4, 6-31, and 33-39 stand rejected under the following 102 and 103 rejections.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6, 7, 9-27, 29-31, and 33-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al (JP 06-267577).

Regarding claims 1-4, 13-24, 29, 31, 33, 35, and 38, the Sato reference discloses a fuel cell system and a method of operating a fuel cell system comprising: combining the fuel cells to provide a plurality of fuel cell stacks "S1" to "Sn"; electrically connecting the stacks in parallel to provide a standard voltage range across each of the stacks and to generate a detected output current through a load; obtaining a desired output current value "Ioi" from each of the stacks; and regulating the current produced by each of the stacks around the desired output current value by using the controller "C" to control the input valves and output valves of each stack wherein each individual stack current is individually balanced based upon the actual total output current of all of the stacks by adjusting parameters such as the pressure, temperature, and concentration affecting the input and output of fuel gas and air to each of the stacks individually (See Abtract and paragraphs [0011],[0017],[0021],[0028],[0031,[0032]). It also discloses a controller "C" that compares the detected output current of fuel cell stacks S1 through Sn with target values separately set by each so as to control gas feed valves IA and IB for the respective stacks (See Abstract).

Examiner's note: The Sato reference discloses automatically controlling each output current of a plurality of fuel cell stacks and balancing each output current which implies that the output currents of the plurality of fuel cell stacks have to be adjusted in some order or sequence, even if the order is random.

Regarding claims 6, 7, and 34, it also discloses a controller "C" that controls a first current through a first stack and a second current through a second stack wherein the second current is controlled independently of the first current and wherein the first and second currents are based upon rated capacity of each stack "Ioi" which is proportional to active areas of the first and second stacks (See paragraphs [0031],[0032]).

Regarding claim 9, it also discloses current detectors "ID1" to "IDn" that are connected for every output current of each stack to determine the gross load current (See paragraph [0022]).

Regarding claim 10 and 27, it also discloses setting up flow rates of fuel and air according to measured output current of the fuel cell stacks (See paragraph [0010]).

Regarding claim 11, 25, 26, 36, 37, and 39, it also discloses oxygen concentration means which inherently would comprise a pair of oxygen sensors that sense oxygen consumption by each stack by determining the oxygen concentration in a cathode inlet and outlet; and determining the desired current through each stack using the determined oxygen consumption (See paragraph [0012]).

Regarding claim 12 and 30, it is inherent that the total power is adjusted by adjusting the plurality of parallel stacks.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 8 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al (JP 06-267577) in view of Dickman et al (US 2001/0049038). The Sato reference is applied to claims 1 and 19 for reasons stated above.

However, Sato et al does not expressly teach a contactor connected between one of the stacks and the load and a method of controlling power to a load supplied by a plurality of fuel cells comprising controlling at least one input to a given stack to eliminate a current through the given stack. The Dickman reference discloses a contactor "100" for isolating a fuel cell stack from the applied load and a method of interrupting the flow of hydrogen and air to a particular stack so that the stack does not produce electric current (See paragraphs [0059],[0061]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sato fuel cell system to include a contactor connected between one of the stacks and the load and a method of controlling power to a load supplied by a plurality of fuel cells comprising controlling at least one input to a given stack to eliminate a current through the given stack in order to increase the lifetime of the stacks by isolating one or more stacks during periods when power consumption is at a minimum.

***Response to Arguments***

7. Applicant's arguments filed 10/12/07 have been fully considered but they are not persuasive.

The applicant argues that Sato supervises each output current and controls the valves randomly (as needed) to compensate for these fluctuations. Therefore, Sato fails to teach or suggest the limitation of sequentially adjusting currents provided by each of the fuel cell stack as claims 1, 13, 19, 31, and 35 recite. The examiner does not concede that Sato teaches controlling individual currents of fuel cell stacks randomly because there is no explicit teaching of controlling the valves randomly to compensate for fluctuations in the output currents of each fuel cell stack. An English translation of the Sato reference has been ordered to clarify this assumption and will be available in the next office action. Even if Sato does teach randomly adjusting the current of each fuel cell stack, this random adjustment of the currents can be construed as a random sequence. There are no limitations in the claims that require the sequentially adjusting ones of the currents to be based upon a predetermined sequence or iteratively from stack 1 to stack N. Further, there are no requirements in the claims that require the current of each and every stack to be adjusted in order from stack 1 to stack N. Therefore, the examiner maintains the assertion that a random sequence of adjusting the current of each stack still reads on the claims of the present application.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 7:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

JONATHAN CREPEAU
PRIMARY EXAMINER